



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/664,565	09/18/2003	Jeffrey Meisner	TRIS-1001USCON	4604

7590 07/26/2005
John L. Knoble, Esq.
KNOBLE YOSHIDA & DUNLEAVY LLC
Eight Penn Center, Suite 1350
1628 John F. Kennedy Blvd.
Philadelphia, PA 19103

EXAMINER

AZARIAN, SEYED H

ART UNIT PAPER NUMBER

2625

DATE MAILED: 07/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/664,565

Applicant(s)

MEISNER ET AL.

Examiner

Seyed Azarian

Art Unit

2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 September 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7,9,11-39 and 41-50 is/are rejected.
- 7) ☒ Claim(s) 8,10 and 40 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/29/03.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.3218 may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-50 rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-28, of U.S. Patent No. 6,625,299. Each of the limitation set forth in the claims of the instant application is defined in the claims of the patent.

For example consider claim 1, of current application, compared to claim 1, of patent application, it disclose a method for tracking the position and orientation of an object, comprising the steps of:

(a) scanning across an object to detect fiducials, and form runs (column 13 lines 38-41);

(b) clumping video runs to detect a pattern of fiducials wherein the step of clumping video runs (column 13, lines 42-43);

(c) acquiring estimated values for a set of tracking parameters by comparing a detected pattern of fiducials to a reference pattern of fiducials (column 13, lines 47-53);

(d) iterating the estimated values for the set of tracking parameters until the detected pattern of fiducials match the reference pattern of fiducials to within a desired convergence (column 13, lines 63-65).

Claim 7, of current application, compared to claim 2, of patent application, it disclose a method for tracking the position and orientation of an object of claim 1, wherein the detected and reference patterns of fiducials includes a pseudo random pattern of soft fiducials and wherein the step of acquiring estimated values for a set of tracking parameters includes the step of electing at least one of the soft fiducials with the reference pattern of fiducials to estimate the X-bar and Y-bar position parameters (column 12, lines 39-66).

Claim 15, of current application, compared to claim 28, of patent application, it disclose a method for augmenting reality of claim 13, wherein said step of scanning across the object to detect the fiducials includes the step of forming a signal corresponding to the detected pattern of fiducials, removing noise from the signal, and reducing the bandwidth of the signal (column 16, lines 25-29).

Claim 33, of current application, compared to claim 11, of patent application, it disclose a method according to claim 32, wherein said step of electronically reducing said virtual information comprises electronically filtering said information to eliminate background information.

Claim 34, of current application, compared to claim 12, of patent application, it disclose a method according to claim 32, wherein said step of electronically reducing said virtual information comprises electronically filtering said information to eliminate noise.

Claim 35, of current application, compared to claim 13, of patent application, it disclose a method according to claim 34, wherein said step of electronically filtering said information to eliminate noise comprises electronically correcting to compensate for known aberrations of at least one hardware element.

Claim Objections

3. Claim 46 objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 112 does not exist.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

5. Claims 1-7, 9, 11-16, 18-22, 25-39 and 41-50, are rejected under 35 U.S.C. 102(e) as being anticipated by Hirota et al (U.S. patent 6,064,749).

Regarding claim 1, Hirota discloses method for tracking the position and orientation of an object, comprising the steps of:

(a) scanning across an object to detect fiducials, wherein a video run is formed by a scan (column 6, lines 30-36, generating images to locate landmarks within the field of view, also column 5, lines 45-52, tracking system and CCD video cameras (scanning);

(b) clumping video runs to detect a pattern of fiducials (see column 3, line 13-25, refer to physical tracking camera position and orientation, and "fiducials" are utilized as the landmarks, also column 6, lines 50-54);

(c) acquiring estimated values for a set of tracking parameters by comparing a detected pattern of fiducials to a reference pattern of fiducials (column 7, lines 20-40, the term fiducial refers to landmarks, also column 11, lines 10-29, comparing between two predicted position);

(d) iterating the estimated values for the set of tracking parameters until the detected pattern of fiducials match the reference pattern of fiducials to within a desired convergence (column 8, lines 58-64, compute and landmark predictor to iteratively detect additional landmarks, also column 16, lines 56-63 using iterative procedure).

Regarding claim 2, Hirota discloses the method for tracking the position and orientation of an object of claim 1, wherein the step of scanning across an object to detect a fiducials includes the step of setting a predetermined threshold voltage level for

Art Unit: 2625

detecting a fiducial, and identifying fiducial edges when an output voltage from an optical sensor crosses the predetermined voltage level (column 9, lines 51-66, initial landmark location and second image based upon the predicted location and landmark located "within the defined search" region).

Regarding claim 3, Hirota discloses the method for tracking the position and orientation of an object of claim 1, wherein the step of clumping video runs includes the step of combining adjacent video runs and extracting relevant information from the video runs (column 17, lines 39-47, extracting information).

Regarding claim 4, Hirota discloses the method for tracking the position and orientation of an object of claim 3, wherein a pixel is recorded by recording a scan line number and a pixel number for each pixel that has a video level above the predetermined threshold (column 11, lines 53-60, refer to predefined range).

Regarding claim 5, Hirota disclose the method for tracking the position and orientation of an object of claim 1, wherein the step of clumping video runs includes the steps of detecting and removing noise from the video runs (column 17, lines 2-14, minimize the residual error).

Regarding claim 6, Hirota discloses the method for tracking the position and orientation of an object of claim 1, wherein the detected and reference patterns of fiducials includes a geometrically consistent pattern of hard fiducials and wherein the step of acquiring estimated values for a set of tracking parameters includes the step of corresponding a predetermined number of detected hard fiducials with the reference pattern of fiducials to estimate phi, theta and psi orientation parameters and to estimate

Art Unit: 2625

a distance position parameter (column 11, lines 50-62, number of marked pixels in both the inner dot and the outer ring are determined and ratio is computed).

Regarding claim 7, Hirota discloses the method for tracking the position and orientation of an object of claim 1, wherein the detected and reference patterns of fiducials includes a pseudo random pattern of soft fiducials and wherein the step of acquiring estimated values for a set of tracking parameters includes the step of electing at least one of the soft fiducials with the reference pattern of fiducials to estimate the X-bar and Y-bar position parameters (column 13, lines 37-40, landmarks are found on the two cameras' image planes, these landmarks provide 3 X-Y coordinate pairs).

Regarding claim 9, Hirota et al disclose the method for tracking the position and orientation of an object of claim 1, wherein the step of iterating the estimated values for the set of tracking parameters uses the method of least squares (column 15, lines 21-23, allows for the determination of an optimum solution using all the detected landmarks).

Regarding claim 11, Hirota discloses a method for augmenting reality, comprising steps of: (a) tracking the position and orientation of a pattern of fiducials on an object with a self-contained, mobile system (column 5, lines 50-59, view the augmented reality in the head mounted display, also column 9, lines 20-25);

(b) processing virtual information stored in a computer memory of said system according to the position and orientation of the object (column 5, lines 26-37, refer to computer-readable storage);

(c) presenting the virtual information with real information to a user in near real time with said system (column 6, lines 7-16, transferring image in real-time).

Regarding claim 12, Hirota discloses the method for augmenting reality of claim 11, wherein the pattern of fiducials are disposed on the object surface in a geometrically consistent hard fiducial pattern and in a pseudo random soft fiducial pattern (column 5, lines 67 through column 6, line 1-5).

Regarding claim 14, Hirota discloses the method for augmenting reality of claim 13, wherein the said step of scanning across the object to detect the fiducials includes the steps of setting a predetermined threshold voltage level for detecting a fiducial and identifying fiducial edges when an output voltage from an optical sensor crosses the predetermined voltage level (column 9, lines 51-66, initial landmark location and second image based upon the predicted location and landmark located "within the defined search" region).

Regarding claim 15, Hirota discloses the method for augmenting reality of claim 13, wherein said step of scanning across the object to detect the fiducials includes the step of forming a signal corresponding to the detected pattern of fiducials, removing noise from the signal, and reducing the bandwidth of the signal (column 7, lines 21-34, error correcting (removing noise), transformation);

and electing at least one of the soft fiducials with the reference pattern of fiducials to estimate X-bar and Y-bar position parameters (column 13, lines 37-40, landmarks are found on the two cameras' image planes, these landmarks provide 3 X-Y coordinate pairs).

Regarding claim 18, Hirota discloses the method for augmenting reality of claim 11, wherein the computer memory forms a part of a wearable computer, the wearable computer having processor which performs said step of processing virtual information stored in the computer memory according to position and orientation of the object (column 6, lines 7-16).

Regarding claim 19, Hirota discloses the method for augmenting reality of claim 11, wherein said step of presenting the virtual information with real information to a user in near real time includes the step of projecting the virtual information on a head mounted display (column 6, lines 7-16, computer generated graphics, and composite images are then display).

Regarding claim 20, Hirota discloses the method for augmenting reality of claim 11, wherein said step of presenting the virtual information with real information to a user in near real time includes the step of projecting the virtual information on an Optical See Through display (column 6, lines 7-16, transferring image in real-time).

Regarding claim 21, Hirota discloses the method for augmenting reality of claim 11, wherein said step of presenting the virtual information with real information to a user in near real time includes the step of projecting the virtual information and the real information on a Video See Through display (column 6, lines 40-49, computer generated graphics are registered to object in the real word).

Regarding claim 22, Hirota discloses the method for augmenting reality of claim 11, wherein said steps of tracking the position and orientation of the object, retrieving virtual information, and presenting the virtual information with real information are

Art Unit: 2625

performed with an update rate of at least 60 Hertz and a latency below 16 milliseconds (column 9, lines 4-13).

Regarding claim 25, Hirota discloses the method for augmenting reality of claim 11, further comprising the step of calibrating the alignment between the virtual information and the real information (column 7, lines 1-4).

Regarding claim 27, Hirota discloses a method according to claim 26, wherein step (d) comprises providing computer-generated aural information to a user (column 5, lines 53-58, head mounted unit is worn by a user for communication, also column 7, lines 41-48, refer to stereo cameras).

Regarding claim 28, Hirota discloses a method according to claim 26, wherein step (d) comprises providing computer-generated kinesthetic information to a user (column 6, lines 27-42, refer to background (kinesthetic)).

Regarding claim 29, Hirota discloses a method according to claim 26, wherein step (a) comprises using a sensor to provide at least one signal that is indicative of a pattern of fiducials on a user's eye (column 5, lines 50-59, user which views the augmented).

Regarding claim 30, Hirota discloses a method according to claim 26, wherein said sensor is mounted on a user's head (column 5, lines 50-59, refer to head mounted display).

Regarding claim 32, Hirota discloses a method according to claim 26, wherein at least one of steps (b) and (c) are performed by electronically reducing said virtual information to a reduced amount of information for manageable processing (column 11,

Art Unit: 2625

lines 31-49, image analyzer 42, reduces the search areas while refining its estimate of the landmark's location).

Regarding claim 37, Hirota discloses a method according to claim 32, wherein said step of electronically reducing said virtual information comprises a step of determining a centroid position of at least one of said fiducials (column 11, line 53 through column 12, line 9, refer to center, inner and outer area).

Regarding claim 49, Hirota discloses a method according to claim 48, wherein said quick acquire routine tracks movement of the system with respect to the object and utilizes data pertaining to said movement to predict likely future locations of said fiducial (column 5, lines 39-59, movement and tracking system).

Regarding claims 13, 16, the arguments analogous to those presented for claims 1, 6, are applicable.

Regarding claims 26 and 31, the arguments analogous to those presented for claims 1, 11 and 18 are applicable.

Regarding claim 33-36 and 38-39, the arguments analogous to those presented for claims 1, 5, 10 and 37 are applicable.

Regarding claims 41-46, the arguments analogous to those presented for claims 1, 6 and 7 are applicable.

Regarding claims 47-48 and 50, the arguments analogous to those presented for claims 1 and 27-28 are applicable.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 17, is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirota et al (U.S. patent 6,064,749) in view of Carollo (U.S. patent 5,912,650).

Regarding claim 17, Hirota do not explicitly state, "process of fabricating wire harnesses". On the other hand Carollo teaches column 5, line 20-26, providing the user with an augmented reality with additional information regarding a scene under view such as wiring harness.

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made, to modify Hirota et al invention according to the teaching of Carollo because it combined with a see-through display, to providing the user with an augmented reality. This is particularly useful for night vision application or when it is useful to provide the user with additional information regarding a scene under view.

8. Claim 23-24, are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirota et al (US patent 6,064,749) in view of DeMenthon (U.S. patent 5,227,985).

Regarding claim 23, Hirota do not explicitly state, "user selects menu item by moving a cursor over a desired selection". On the other hand DeMenthon teaches

Art Unit: 2625

(column 6, lines 16-29, a virtual cursor of known 3D structure is considered to be rigidly linked to the object and therefore move along with object, also column 18, lines 9-27, screen cursor 94 is the perspective projection of a virtual 3D cursor of known 3D structure).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made, to modify Hirota et al invention according to the teaching of DeMenthon because it provides a tool to interact with the other virtual objects of the scenery, which can easily be implemented in a image device such as video camera.

Regarding claim 24, the arguments analogous to those presented for claim 23 are applicable.

Allowable Subject Matter

9. Claims 8, 10 and 40, objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Other prior art cited

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. patent (U.S.5,412,569) to Corby, Jr. et al is cited for augmented reality

Art Unit: 2625

maintenance system with archive and comparison device.

Contact Information

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seyed Azarian whose telephone number is (571) 272-7443. The examiner can normally be reached on Monday through Thursday from 6:00 a.m. to 7:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta, can be reached at (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application information Retrieval (PAIR) system. Status information for published application may be obtained from either Private PAIR or Public PAIR. Status information about the PAIR system, see [http:// pair-direct.uspto.gov](http://pair-direct.uspto.gov). Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Seyed Azarian
Patent Examiner
Group Art Unit 2625
July 19, 2005


DANIEL MIRIAM
PRIMARY EXAMINER